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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,341

05/16/2007

Hidenori Takagi

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07/23/2009

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EXAMINER

WILSON, ALLAN R

ART UNIT

PAPER NUMBER

2815

MAIL DATE

DELIVERY MODE

07/23/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,341	Applicant(s) TAKAGI ET AL.	
	Examiner ALLAN R. WILSON	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 13-27 is/are pending in the application.
- 4a) Of the above claim(s) 4, 15, 18, 21, 24 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 13, 14, 16, 17, 19, 20, 22, 23, 25 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/25/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by US

Patent Application Publication No. 2005/0151213 to Casey et al. (hereinafter “Casey”).

Regarding claim 1, Casey illustrates in at least figures 1-4 with the associated text:

A thermistor device comprising a first layer 150, 170 comprised of a first substance having a positive or negative temperature coefficient of resistance (Table I) and a second layer 180 comprised of a second substance having conductivity 180 (contact vias) or semiconductivity 190 (ILD) and located directly on the first layer.

Regarding claim 19, Casey discloses in paragraph [0033] said second substance is selected from the group consisting of n-type semiconductive oxides or p type semiconductive oxides 190 (*i.e.* borophosphosilicate glass, BPSG) [BPSG is doped with both p and n type elements].

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 3, 13, 14, 16 and 17 are rejected under 35 USC § 103 (a) as being unpatentable over Casey as applied to claims 1 and 3 above, and further in view of U.S. Patent No. 6,337,991 to Li et al. (hereinafter “Li”).

Regarding claim 2, Casey is discussed above, it does not specifically show said first substance is a substance having a positive temperature coefficient of resistance and having 100 mΩ cm or less at operating temperature or lower. Li illustrates in figures 1 and 3-5 several substances having a positive temperature coefficient of resistance and having 100 mΩ cm or less at operating temperature or lower. It would have been obvious to one of ordinary skill in the art at the time the invention was made for Casey to have a positive temperature coefficient of resistance and having 100 mΩ cm or less at operating temperature or lower. The motivation for

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doing this is to provide the highest temperature coefficient of resistance (TCR) in a useful range of temperature (Li col. 3, lines 57-58). [The “operating temperature” was determine from figures 5 and 7 to be about 300 K or less.]

Regarding claim 3, it would have been obvious for the limitation “the interface between the first and second layers changes to a pn junction, as the first substance changes from being conductive to semiconductive or insulative at or near the transition temperature T_{M-1} ” since a device has the properties which meet the claimed limitation once the claimed materials and structure are present. Since the claimed material and structure limitation are met by Casey and Li, the limitation relating to the properties of the interface are also met as a natural result.

Regarding claims 13 and 14, it would have been obvious for the limitation “said first substance is selected from substances which belong to the strongly correlated electron systems” since a device has the properties which meet the claimed limitation once the claimed materials and structure are present. Since the claimed material [i.e. $(La_{0.7}Ca_{0.3})MnO_3$, col. 6, line 64)] and structure limitation are met by Casey and Li, the limitation relating to the properties of the first substance are also met as a natural result.

Regarding claims 16 and 17, Li discloses in col. 6, line 64, said first substance is manganese oxides $(M'_{(1-z)}M''_z)MnO_3$ (M' represents an alkaline earth element [La], M'' represents a rare earth element [Ca]).

Regarding claim 20, Casey discloses in paragraph [0033] said second substance is selected from the group consisting of n-type semiconductive oxides or p type semiconductive oxides 190 (i.e. borophosphosiccate glass, BPSG) [BPSG is doped with both p and n type elements].

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Claims 22 and 23 are rejected under 35 USC § 103 (a) as being unpatentable over Casey as applied to claim 1 above.

Regarding claims 22 and 23, the prior art of record does not specifically disclose the claimed thickness range of 1000 nm or less. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Casey by using a thickness value within the claimed range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 25 and 26 are rejected under 35 USC § 103 (a) as being unpatentable over Casey as applied to claims 1 and 3 above, and further in view of US Patent Application Publication No. 2005/0231174 to Iwatani et al. (hereinafter "Iwatani").

Regarding claims 25 and 26, Casey is discussed above, it does not specifically show a voltage control means for controlling an applied voltage to the thermistor device. Iwatani illustrates in figure 6 a voltage control means (A) for controlling an applied voltage to the thermistor device 312g. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Casey device used in the Iwatani circuit. The motivation for doing this is to use the thermistor as part of a temperature detector (Iwatani paragraphs [0023] and [0025])

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See the Information Disclosure Statement.

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Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is (571) 272-1738. Examiner Wilson can normally be reached 7:00-3:30 Monday-Friday (first Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Allan R. Wilson/
Primary Examiner, Art Unit 2815